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ABSTRACT

This study compared the academic achievement and retention of transfer students and native students at one university on a class-by-class basis for: (1) returning native and returning transfer students and (2) returning native and new transfer students. These comparisons are intended to take into account expected lower freshman retention rates and expected lower retention rates of first-year students at this particular institution, as well as differential access to such resources as financial aid and housing. Outcome measures used to assess student success were retention and graduation after one year, cumulative grade point average, and whether the student was academically dismissed. The study found that transfer students, as a group, performed less well than native students on all four outcome measures, and that academic performance for both native and transfer students increased by class level. Depending on which additional factors are considered, transfer students are retained at rates 1 to 9 percent lower than native students; graduate at rates 2 to 8 percent lower than native students; earn grade point averages 1/10 to 2/10 of a grade point lower; and are academically dismissed at rates 3 to 6 percent higher. These performance differences are somewhat reduced after taking into account access to housing and financial aid resources. (Contains 14 references and 7 tables.) (DB)

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Assessing Transfer and Native Student Performance at Four-Year Institutions

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This paper was presented at the Thirty-Ninth Annual Forum of the Association for Institutional Research held in Seattle, Washington, May 30-June 3, 1999.
This paper was reviewed by the AIR Forum Publications Committee and was judged to be of high quality and of interest to others concerned with the research of higher education. It has therefore been selected to be included in the ERIC Collection of AIR Forum Papers.

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Assessing Transfer and Native Student Performance at Four-Year Institutions

Do transfer students perform poorly in comparison with native students? This paper answers the question through an analysis of transfer and native student performance at the university in four areas: retention, graduation, grade-point average and academic dismissals. The emphasis is on making appropriate comparisons between the two groups, because differences in performance may be due to social factors such as integration difficulties in addition to academic factors such as poor preparation. Using returning students rather than new students and controlling for the number of credits earned results in groups of transfers and natives that are much more homogenous than the traditional cohorts of new transfers and natives, allowing for more appropriate performance comparisons. With this approach natives score better on all four measures, although the difference lessens when controlling for access to resources such as financial aid and demographics.

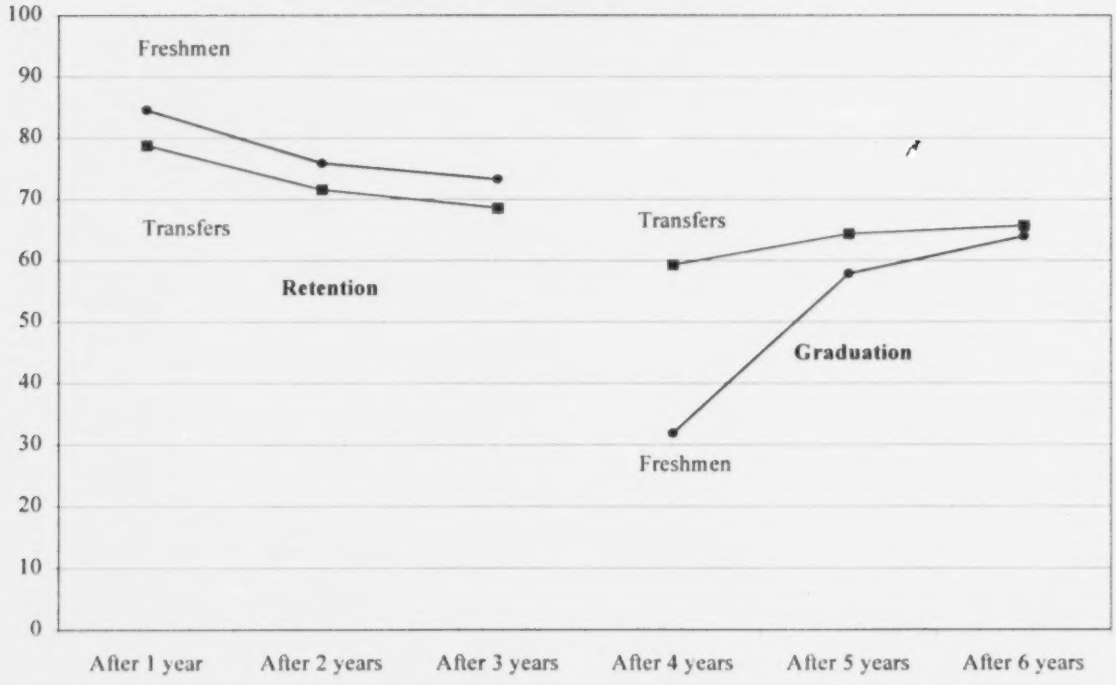
Assessing Transfer and Native Student Performance at Four-Year Institutions

Introduction

It is commonly thought that students who enter college by transferring from other institutions are less qualified than students who enter as first-time college students. As a result transfer students supposedly perform poorer academically and are retained at lower rates. At the University of XXXX a variety of evidence supports this view, such as the impressions of faculty concerning transfer quality, the admittance of transfers who had applied as first-time freshmen and were rejected (in recent years the proportion has ranged from 13%-19% of transfer admissions), and the lower one-year retention rates for transfer student cohorts. In addition, a recent survey of transfers and first-time freshmen at the university indicates that more freshmen than transfers graduated in the top 10% of their high school class (34% and 24% respectively) (Miville and Sedlacek, 1995).

Conversely, there is some evidence that transfers outperform freshmen in terms of

Figure 1. Retention and Graduation Rates, Full-Time Degree-Seeking Students Entering Fall 1992.



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graduation rates. Figure 1 presents retention and graduation rates for the cohorts of full-time degree-seeking freshmen and transfers entering the university in Fall 1992. Freshmen have higher retention rates than transfers, but the relationship is reversed for graduation rates.

Are transfer students truly less qualified, or is this simply a myth? The purpose of this paper is to methodically evaluate transfer performance to see how transfers compare with first-time freshmen. By analyzing the backgrounds and behavior of recent transfer and freshman cohorts this paper will shed light on what evidence, if any, supports this belief.

Understanding transfer success is vital for several reasons. First, many institutions accept a large number of transfers, and the number of students attempting to transfer will most likely increase in the near future. Distance education is playing a larger role in post-secondary education. Taking lower level courses through distance education or at a community college and finishing at a more prestigious four-year institution may become an option for many working students. More people are realizing the economic value of a college education and the number of people seeking a college education is increasing.

Second, every institution would like to admit students who will do well and graduate in a timely manner. Admitting a student who will likely stop out is not in the interest of either the institution or the student. Lackluster academic performance by major segments of the student population also reflects poorly on an institution and may affect its academic reputation.

Third, assessing transfer performance vis-à-vis freshmen provides a way to evaluate transfer admission criteria. If transfers are performing poorly, should an institution raise minimum GPA requirements or instead concentrate on students from certain types of transfer institutions? Questions such as these can only be answered with a detailed and thorough analysis of transfer student performance.

However, comparing transfer and freshman performance is not as simple as it would seem. Transfers and freshmen experience very different academic careers and may have differential access to resources such as financial aid. Only by taking into account these differences can accurate assessments be made. Thus a major portion of the paper will be devoted to discussing issues in comparing freshman and transfer performance and will propose a new method to measure academic success of the two groups.

Admission policies

Before we begin our analysis, it would be useful to understand how both transfers and freshmen arrive at the university. With the exception of continuing education students, new undergraduates are classified as either new (or first-time) freshmen or new transfers.

A student graduating from high school applies as a freshman and is admitted on the basis of several factors including high school GPA and scores on the SAT/ACT. Although these students are usually new to post-secondary institutions, they may have previously attended a post-secondary institution (for example, summer school) as long as they earned less than twelve credits.

If more than twelve credits were earned in a regular semester after high school, the student must apply as a transfer. Generally admission is based on an evaluation of college transcripts; however, those students with less than 28 semester hours must also submit high school transcripts and SAT/ACT scores. In addition, some students from state community colleges are eligible for mandatory admission if they have a minimum GPA of 2.0 and have completed an Associate's degree or 56 credit hours[1].

Data description

There are two caveats to keep in mind about the data used in this paper. First, the source data vary from table to table and cover several time periods. Time periods are noted in the text and in individual tables.

Second, the data used only reflect a subset of all undergraduates. The university uses two classifications, credit load and degree intent, to identify a cohort of full-time degree-seeking students on which we report numbers to various governmental and non-governmental agencies. Students are defined as full-time if they are registered for twelve or more credit hours during their first semester, and degree-seeking if they declared themselves to be pursuing a degree when initially enrolling[2]. The rationale underlying the selection of this cohort for reporting purposes is that part-time and non-degree seeking students are not expected to behave in the same manner as the more traditional full-time degree seekers and may distort numbers such as graduation rates (e.g., part-

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[1] See the *Undergraduate Catalog* for more information.

[2] Declaration of a certain major can also determine degree intent. For example, students enrolled in the Institute of Applied Agriculture are considered non-degree seeking.

timers take much longer to complete a degree). This approach has in essence become a national standard and is used by most other institutions in their reporting. For the rest of the report we will adopt a similar convention and consider only full-time degree-seeking students.

Transfer students are more likely to be part-time students than freshmen, with only 81% of new transfer students in Fall 1998 registering full-time, as opposed to 99% of new freshmen. Overall, 99% of new freshmen can be considered full-time degree-seeking, while only 76% of new transfers can be classified as such.

Definitions

One source of confusion when discussing transfers and freshmen is terminology. Often students who have junior or senior level credit loads are referred to as freshmen because they entered the university as freshmen rather than transfers. Because we will be comparing different but related groups of students, it is crucial that we first carefully define our terms.

Students registered in a given semester can be divided into two groups, new and returning. New students are students who have just arrived at the university and are attending their first semester here. Returning students, on the other hand, have matriculated in a previous semester. Based on their matriculation status these two groups can be subdivided into first-time freshmen and transfers. First-time freshmen have not previously attended a post-secondary institution before attending the university, while transfers have. First-time freshmen are often referred to in the transfer literature as "natives" - they are native to the university in that they first began their college career here. Based on these categories we can divide *all* undergraduate students registered in a given semester into four different groups:

1. *New natives* – the cohort of new first-time freshmen entering the university in the fall
2. *New transfers* – the cohort of new transfer students entering the university in the fall
3. *Returning natives* – all undergraduates enrolled in the fall who were here in a previous semester and who originally entered the university as first-time freshmen
4. *Returning transfers* – all undergraduates enrolled in the fall who were here in a previous semester and who originally entered the university as transfer students

This terminology will be used in the remainder of the paper.

Assessing Transfer Student Success

Are transfer students less qualified than native students, or is this simply a myth? Unfortunately the question is difficult to answer. High-school grade-point averages or SAT scores can be used as measures of student quality, but because these are not required for most transfer admissions to the university, we lack a standard measure that can be used for both transfers and natives.

Rather than attempt to measure quality, an alternative would examine academic success, where a successful student would be defined as one who does well in classes and graduates in a timely manner. This approach has two advantages. First, measures of success such as grade-point average and retention and graduation rates are readily available for both transfers and natives. Second, the chief concern of most academic communities is the academic performance of transfers vis-à-vis first-time natives at the institution. Therefore performance, rather than measures of quality derived from pre-matriculation behavior, should be analyzed.

Unfortunately post-matriculation measures have a comparability problem. While we can calculate mean GPA, retention and graduation rates for both natives and transfers, the college experiences for each group differ in systematic ways and will have a large impact on how well each group scores. The problem, then, is to calculate performance measures for the two groups of students that will not be affected by their different experiences. The proposed solution is twofold: first, select samples of students that are as similar as possible; and second, use multivariate techniques to control for relevant differences.

It is important to remember that the goal is not to explain all performance differences between the two groups; instead, it is to make the groups more comparable so that we can rely on any performance differences found. The use of first-time, full-time degree seeking freshmen instead of all freshmen as a national reporting standard is meant to result in a group homogenous enough to allow comparisons across institutions. Similarly, we want to construct groups of natives and transfers that are also homogenous, or at least more homogenous than the two groups generally used when reporting retention and graduation rates, new natives and new transfers.

Four problem areas

A review of the literature on transfer student performance indicates differences between

transfers and natives can be divided into four main areas: academic preparedness, adjustment to and integration within the institution, access to institutional resources and course of study (some of the following discussion is taken from Dougherty (1992)).

First, much of the literature posits that transfers are less able and less motivated than natives and are not prepared by their transfer institution for the rigors of a four-year college. For our purposes these differences between transfers and natives do not need to be controlled for; indeed, the entire purpose of this report is to ascertain the impact of such differences. The university would like to admit students with high academic ability, motivated to obtain a college degree and prepared by their previous institution (whether high school or another post-secondary institution) for the rigors of the university's coursework.

Second, adjustment to and integration with the institution are also thought to differ between transfers and natives. All students go through an initial adjustment period during their first year of college. They find themselves among new peer groups and face greater academic challenges compared with high school. The adjustment process can prove so difficult that grades are affected and some students decide to withdraw (Tinto 1993, pp. 45-49). For first-time freshmen this process occurs during their first year. Transfer students, on the other hand, have already gone through this period at their home institution. In addition, transfer students face another adjustment period known as transfer shock (Diaz 1992, Dougherty 1992, Hills 1965). While familiar with the demands of post-secondary institutions, they must still adjust to social and academic life at a four-year institution.

Third, another reason why transfer performance lags behind that of natives may be due to different access to resources. Transfers supposedly receive less or have lesser access to resources that have a significant impact on student behavior. The two most important are financial aid and housing. Transfers are said to receive less financial aid than natives; even if the amount awarded by the institution is comparable, transfers have already accumulated significant debt from their prior schooling and may be unable to take out the loans they need. Because financial aid is thought to impact retention and graduation, this difference must be taken into account. Similarly, transfers may have lower priority than natives for on-campus housing. Again, because living on-campus is thought to affect student behavior such as retention, this difference must be taken into account.

Finally, transfer students are farther along in their college careers than new natives when

they transfer and may select different majors. Transfers usually enter a four-year institution with a substantial number of credit hours. Because most transfers arrive as sophomores or juniors they can be expected to take higher level courses which tend to be more difficult than introductory courses. While the impact on measures such as retention rates is unclear, this difference will affect grade-point average. Transfer graduation rates over a comparable period of time will be inflated. Significant differences in majors may also occur between the two groups, again affecting grade-point average.

Two solutions

The appropriate way to control for these differences would be some sort of multivariate analysis, where the appropriate control variables are included to account for differences between the two groups. For differences such as integration, however, finding variables in the student database that would allow such controls is difficult if not impossible. The alternative would be to change the sample for which the performance measures are calculated. Four samples are available for analysis: the traditional cohorts of new natives and new transfers, plus the two groups of returning natives and returning transfers.

The most common method of comparison uses cohorts of new transfers and new natives who both began school during the same semester (Holohan et.al. 1983, Jones and Lee 1992, Newlon and Gaither 1980, Webb 1971). This is the method most analysts use when discussing performance differences between transfers and freshmen. While most institutions report statistics on these two groups, this approach has two drawbacks. First, transfer students have already gone through the initial adjustment period in their first year of college. Those students who would normally leave during the first year have already been weeded out. The transfer retention rate does not include these students and is somewhat inflated. Many new freshmen, however, may decide that college is not for them, or that they cannot afford the financial burden. These students are included when calculating the new freshmen retention rate. Thus any comparison may understate the difference in retention rates in that the new transfer retention rate should be lower than what has been calculated. Second, transfer students are farther along in their college careers than freshmen. Because most transfers arrive as sophomores or juniors they take a far different set of courses than freshmen and face a different set of academic challenges.

A more promising method compares new transfers with returning natives and has two advantages over comparisons with new natives (Best and Gehring 1993, Dupraw and Michael 1995, House 1989, Saupe and Long 1997). Because both groups have experienced first-year college shock, measures such as retention rates are not artificially inflated for new transfers. This can be seen in Table 1 – the difference in retention rates between new transfers and returning natives is larger than the difference between new transfers and new natives for all five years. In addition, returning natives and new transfers can both be subdivided by class because they comprise students at different points in their academic career. Calculations made on a class-by-class basis (i.e. sophomores to sophomores) avoid comparing students in different stages of their academic career. There is a potential problem with this comparison, however. While both groups have been through their first year of college and have adjusted to the college environment, new transfers have not yet adjusted to their new four-year campus. This transfer shock will negatively impact retention, graduation and GPA measures. Again this can be seen in Table 1 – the one-year retention rate for new transfers is always lower than the rate for returning transfers.

Table 1. One-Year Retention Rates by Student Type

	Cohort year (fall):	1993	1994	1995	1996	1997	Average
New natives	Total	3157	3640	3589	3553	3960	
	Retained	2715	3106	3115	3105	3493	
	Percentage	**86.0**	**85.3**	**86.8**	**87.4**	**88.2**	**86.7**
New transfers	Total	1921	1978	1970	1989	1856	
	Retained	1524	1611	1551	1539	1435	
	Percentage	**79.3**	**81.5**	**78.7**	**77.4**	**77.3**	**78.8**
Returning natives	Total	8967	8977	9619	9992	10166	
	Retained	8060	8093	8585	8907	9065	
	Percentage	**89.9**	**90.2**	**89.3**	**89.1**	**89.2**	**89.5**
Returning transfers	Total	3458	3333	3499	3415	3300	
	Retained	3025	2907	2994	2926	2811	
	Percentage	**87.5**	**87.2**	**85.6**	**85.7**	**85.2**	**86.2**

A third method compares returning transfers to returning natives (Avakian et.al. 1982, Eimers and Mullen 1997, Holohan et. al. 1983, House 1989, Saupe and Long 1997). These two

groups are most alike: both have been through their first year of college, and both have adjusted to the university, so any the above comparability problems are avoided. A comparison of the retention rates for the 1997 cohort in Table 1 demonstrates the difference comparisons using these two groups make. The difference in retention rates between new natives and new transfers is almost 11 percentage points, but the difference between returning natives and returning transfers is only 4 percentage points.

Another advantage of this comparison is that it controls somewhat for differential access to resources such as financial aid and housing. Tables 2 and 3 present data for new natives and new transfers for the Fall 1995 semester. As can be seen, there are large differences between new transfers and new natives in both areas. New freshmen are much more likely to live on campus (as measured by a Resident Life contract) and to receive financial aid, especially grants and scholarships. These differences reflect both institutional policies as well as individual choices. The differences between returning transfers and natives are much smaller, illustrating another advantage in using returning students for performance analyses.

Table 2. Students with Resident Life Contracts by Student Type, Fall 1995

Student type	Matriculation status	Total	On-campus	% on-campus
New	Natives	3,589	2,796	77.9%
	Transfers	1,970	511	25.9%
	difference			**52.0%**
Returning	Natives	9,619	3,099	32.2%
	Transfers	3499	424	12.1%
	difference			**20.1%**

Note: data for fall-matriculation students only.

In addition to sample choice, some differences can also be controlled for in a multivariate equation. The most important variable to control for is number of credits earned, because transfer students enter with a substantial number of credits. By controlling for credit hours we will in essence be comparing two groups at the same point in their academic career. As will be seen, this variable has a large impact on student performance.

Table 3. Mean Financial Aid and Unmet Need by State Residence, Matriculation Status and Student Type, Fall 1995

Residents	New students			Returning students		
	Natives	Transfers	Difference	Natives	Transfers	Difference
Grants	$1,214	$727	**$487**	$673	$788	**-$115**
Scholarships	$929	$144	**$785**	$709	$220	**$489**
Loans	$1,868	$2,832	**-$964**	$1,672	$2,536	**-$864**
Work-study	$54	$48	**$6**	$71	$44	**$27**
Unmet need	-$768	$739	**-$1,507**	-$71	$668	-$739
N	2,305	1,470		6,838	2,705	
Non-residents	New students			Returning students		
	Natives	Transfers	Difference	Natives	Transfers	Difference
Grants	$744	$624	**$120**	$544	$693	**-$149**
Scholarships	$1,762	$287	**$1,475**	$1,287	$419	**$868**
Loans	$2,826	$4,317	**-$1,491**	$2,649	$3,518	**-$869**
Work-study	$66	$82	**-$16**	$136	$151	**-$15**
Unmet need	-$677	$2,218	**-$2,895**	$323	$1,302	-$979
N	1,284	500		2,781	794	

Note: Data for fall-matriculation students only.

Estimating transfer and native student success

The sample used in the next analysis consists of all returning students registered in Fall 1995 who had matriculated as full-time degree-seeking student in a fall semester[3]. Four outcomes are used to measure native and transfer student success. The first two outcomes are retention and graduation after one year. These are measured as whether or not the student was retained or graduated by Fall 1996. The third outcome is cumulative grade point average as of the end Fall 1995. The fourth outcome is whether or not the student was academically dismissed at the end of Fall 1995. Together these four measures provide a broad picture of student performance at the university.

Preliminary data for the four measures are presented in Table 4. The one-year retention and

[3] There is some evidence that students who enter in the spring, especially first-time freshmen, are not as successful as students who enter in the fall. Because transfers have a larger proportion of these students, limiting the sample to fall matriculation students helps ensure the comparability of the two groups.

graduation rates, GPA and dismissal rates are calculated for both natives and transfers as a whole as well as by class (as determined by cumulative credits earned at the beginning of the Fall 1995 semester). A clear pattern emerges for all four measures. Differences between natives and transfers at the class level are almost always larger than differences between the two groups as a whole. The overall difference in one-year retention between the two groups is only 3.7%. Yet by class level the differences are the same or much larger, ranging from 4 to 23 percentage points. For one measure, graduation after 1 year, the difference reverses from transfers having higher graduation rates to lower graduation rates. Here transfers appear to do better than natives overall, yet senior transfers do worse than native transfers, while juniors in both groups do about the same.

The reason behind this result is simple. For all four measures, *performance for both natives and transfers increases by class*. Because more students stop out during their freshman and sophomore years, one-year retention rates for juniors and seniors tend to be higher. GPA also increases over time as students become acclimated to the university and less committed students stop out. Graduation rates obviously increase as the number of credits earned increase.
This has an impact on differences between native and transfer returning students because their distributions by class are very dissimilar: natives have much larger proportions of freshmen and sophomores and much smaller proportions of juniors and seniors than transfers. The distributions of the two groups by class are displayed at the bottom of Table 4. 90% of returning transfers are classified as juniors or seniors, while only 60% of natives are juniors or seniors. Because juniors and seniors tend to score higher, and because they make up such large parts of the total returning transfer students, transfers overall appear to score well when compared with natives (and higher in the case of graduation). But this advantage disappears when controlling for class.

One drawback to the tabular approach in Table 4 is that for each of the four performance measures there are four numbers for each student type, one for each class level, for a total of 16 numbers. Relying on one number for each measure would be less confusing, but as explained previously overall measures for natives and transfers that do not control for class level can be misleading. An alternative approach would statistically estimate the four performance measures while controlling for credits earned. The resulting coefficients can be interpreted as the "average" difference between natives and transfers while taking into account their progress at the university.

Table 4. Performance Measures for Returning Native and Transfer Students by Class, Fall 1995-Fall 1996

		Natives	Transfers	Difference
1-year retention rate	Freshmen	77.8	54.6	**-23.2**
	Sophomores	88.7	75.4	**-13.3**
	Juniors	91.4	82.5	**-8.9**
	Seniors	93.2	88.9	**-4.3**
	TOTAL	89.3	85.6	**-3.7**
		Natives	Transfers	Difference
1-year graduation rate	Freshmen	0.0	0.0	**0.0**
	Sophomores	0.0	0.0	**0.0**
	Juniors	4.7	4.5	**-0.2**
	Seniors	67.0	57.1	**-9.9**
	TOTAL	21.1	35.7	**14.6**
		Natives	Transfers	Difference
Cum. grade point average (end of semester)	Freshmen	2.21	2.40	**0.19**
	Sophomores	2.77	2.25	**-0.52**
	Juniors	2.84	2.57	**-0.27**
	Seniors	2.94	2.82	**-0.12**
	TOTAL	2.76	2.69	**-0.07**
		Natives	Transfers	Difference
Dismissal rate (end of semester)	Freshmen	11.8	9.1	**-2.7**
	Sophomores	3.5	15.4	**11.9**
	Juniors	4.4	13.0	**8.6**
	Seniors	1.5	4.3	**2.8**
	TOTAL	4.3	8.0	**3.7**
		Natives	Transfers	Difference
Distribution of class	Freshmen	**13.8%** (1327)	**0.3%** (11)	**-13.5%**
	Sophomores	**30.2%** (2902)	**9.6%** (337)	**-20.6%**
	Juniors	**26.3%** (2534)	**29.8%** (1044)	**3.5%**
	Seniors	**29.7%** (2856)	**60.2%** (2107)	**30.5%**
	TOTAL	**100.0%** (9619)	**100.0%** (3499)	

The estimation method is as follows. Using either multiple or logistic regression, the four outcome measures were estimated two ways. The first set of equations included only an indicator variable measuring whether or not the student was a transfer. The second set of equations also included credits earned as a control variable. The size and significance of the transfer indicator variable measures performance differences for the two groups of students.

Table 5. Performance Measures for Returning Native and Transfer Students, Fall 1995-Fall 1996

	Controlling for matriculation status only			Controlling for matriculation status and credits earned		
Predicted measure	Natives	Transfers	Difference	Natives	Transfer	Difference
1-year retention rate	89.3	85.6	**-3.7**	90.8	82.5	**-8.3**
1-year graduation rate	21.1	35.7	**14.6**	12.2	7.6	**-4.6**
Cum. grade point average (end of semester)	2.78	2.71	**-0.07**	2.82	2.60	**-0.22**
Dismissal rate (end of semester)	4.3	8.0	**3.7**	3.0	10.5	**7.5**

In each model the transfer indicator variable and credits earned variable were significant at $p<.01$. Table 5 provides the estimated performance of transfers and natives for the four measures using the coefficients from the equations for both returning transfers and natives. The left-hand side of the table presents estimated performance on the four measures controlling for matriculation status. Note that the numbers match the total numbers in Table 4. The right-hand side of the table contains results from controlling for both matriculation status and credits earned.

The results indicate large differences in retention and graduation rates for returning transfers and natives. On average, the transfer retention rate is 8 percentage points lower, while the graduation rate is almost 5 percentage points lower. There is a similar gap for GPA, with transfers on average earning GPAs two-tenths of a grade point lower than natives. The dismissal rate is also much larger for transfers, 7.5 percentage points.

The results here seem to contradict the numbers presented in Figure 1, which show transfers graduating at higher rates than natives. How can transfers both surpass and follow natives in their

graduation rates? One way to view transfer and native student performance (especially in terms of graduation) is to think of two runners racing to complete a lap around a track. The native runner begins at the starting line and sprints the entire way, but the transfer runner starts halfway around the track and jogs. The transfer runner wins the race. We can reach two conclusions depending on our view the race. Looking to see who finished first is one way. But looking at their respective speeds is another: in this case the native runner was faster, and if the course had been the same length would have won instead. Academic performance can be viewed in a similar fashion. Figure 1 simply shows who finished first in the "race" towards graduation, while Table 5 takes into account the starting position of transfers. When comparing transfers and natives, taking into account their respective starting places can yield different conclusions about performance.

Controlling for other differences

One objection to the preceding analysis is that many relevant differences between natives and transfers still exist, even after changing the sample and controlling for credits earned. Although differences in the proportion of students in campus housing and receiving financial aid are less for returning students than for new students, transfers are still more likely to live off campus and receive less aid. Other factors may also be at work. Transfers may pursue different academic programs than natives, for example.

Variables measuring housing status or academic program can be used to control for these differences; however, they create an additional problem. Many of these variables are correlated with other factors that affect academic performance, such as finances or student motivation to complete their degree. Housing illustrates the problem. On-campus housing certainly acts as a "safety net", in that students living in the dorms will likely form closer connections with other students and the university in comparison with students who simply commute to class and then leave. These relationships in turn reduce the probability that a student will stop out. Yet the students who live on-campus are not a random sample of all students; instead, they differ in several ways. First, these students generally want the "traditional" college experience of living on campus while attending classes and may be more focused on completing their degree. Second, these students have signed a housing contract, indicating a desire or expectation of staying at the university for at least an entire year. For a student who is unsure whether college is the right choice, a more likely decision is to

maintain flexibility, either by living at home or maintaining their current off-campus residence. Third, the choice to live on campus will also be influenced by finances: students struggling to make ends meet will be more likely to choose cheaper accommodations, either with their parents or in a group house off-campus. So a variable indicating students' housing status measures two factors: the impact of on-campus housing on student performance, and differences in background that cause certain students to select on-campus housing over off-campus housing.

The same argument can be made for unmet need, defined as how much the student needs to pay for their education after taking into account family contributions and financial aid such as grants and student loans. However, many students are reluctant to accrue debt, and this reluctance may in part be fueled by an uncertainty as to whether they wish to stay the necessary time required. Thus students with large unmet need are clearly under financial pressure and can be expected to perform poorly; yet some of these students with large unmet need are also uncertain about their academic career. Use of unmet need in a statistical equation then picks up both effects, and not simply the impact of low resources.

The end result is that many variables that differ between transfers and natives and that have an impact on academic performance can also act as proxies for commitment to completing an education. So we can include these variables in the analysis, but at the same time we may be measuring commitment differences between natives and transfers. One way to view these numbers are as a rough upper and lower bound on performance differences between the two groups. By using only matriculation status and credits earned we know we are missing some factors and may be in a sense maximizing differences, but by including variables such as housing we know we are minimizng differences. Both sets of numbers should give us some idea of performance differences between the two groups.

The equations used to construct Table 5 were re-estimated including the following control variables:

- Unmet need – the total amount of money a student needs to pay for their education after taking into account family and personal contributions and all financial aid.
- Housing contract – whether or not the student had a housing contract with Resident Life for the fall semester.
- Math and English requirements – whether the student had fulfilled fundamental math or English requirements.
- College – variables measuring the major college of the student. Variables indicate if the

student was in Behavioral and Social Sciences, the hard science colleges (Engineering, Life Sciences, Computer, Math & Physical Sciences and Health and Human Performance) or the professional colleges (Agriculture, Architecture, Business and Management and Journalism. The excluded category is Arts & Humanities.

- Age – the age of the student as of the fall semester. A squared term is added to take into account any nonlinear association with the performance measures.
- Gender and race/ethnicity variables – indicator variables measuring if the student was female or a minority. Excluded categories are male and white.
- State residency – if the student was a state resident in the fall semester.

Analyses were replicated for returning natives and transfers for the Fall 1995, Fall 1966 and Fall 1997 semesters. For each semester the equations were estimated twice: first including only the transfer status and credits earned variables (in essence duplicating the results presented in Table 5), and second including the additional control variables described above. Table 6 summarizes the results for the second set of equations. The results are fairly consistent across the three time periods and theoretically make sense. When significant, higher levels of unmet need are associated with lower performance, while students who had satisfied the math and English requirements outperformed those who had not. On-campus housing has a mixed effect – students living on-campus were more likely to be retained and to perform well academically, but less likely to graduate. The age variable is negative while the age squared variable is positive, indicating a curvilinear relationship between age and the four performance measures – performance is higher for younger and older students, and lowest for students aged in the 30-40 range.

Table 7 calculates the average score on the four outcome measures for transfers and natives using the two sets of equations. When controlling for status and credits earned only, differences between transfers and natives for the Fall 1996 and Fall 1997 semesters mirror the results for Fall 1995 presented in Table 5. Adding the control variables described above decreases the differences markedly. The average difference in one-year retention rates for natives and transfers drops from 9 to 1 percentage points. This reduction in performance differences between transfers and natives suggests that some of the difference may be due to differential access to resources. However, significant differences still remain. Even after controlling for access to housing and financial aid, primary major college, and demographic differences between the two groups, natives still outperform transfers on all four measures. Some differences are quite substantial – even with the control variables transfers on average are twice as likely to be academically dismissed as natives.

Table 6. Summary Results of Full Models

	Dependent variable: retention						Dependent variable: graduation						Dependent variable: cumulative GPA			Dependent variable: academic dismissal		
	1 year			2 year		3 year	1 year			2 year		3 year						
Variables	Fall 95	Fall 96	Fall 97	Fall 95	Fall 96	Fall 95	Fall 95	Fall 96	Fall 97	Fall 95	Fall 96	Fall 95	Fall 95	Fall 96	Fall 97	Fall 95	Fall 96	Fall 97
Transfer student	-	-		-	-		-	-	-	-	-		-	-	-	-	-	-
Total credits earned	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Unmet need	-	-		-	-	-						-	-	-	-	-	-	
Housing contract	+	+	+	+	+	+	-	-	-	-	-		+	+	+	+	+	+
Math requirement	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
English requirement	+	+	+	+	+	+		+	+	+	+	+	+	+	+	+	+	+
College – BSOS	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		+	
College – science	+	+	+	+	+	+	-	-	-	-	-	-	+				+	
College – professional	+	+	+	+	+	+				+	+	+	+	+	+	+	+	+
Age	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Age squared	+	+	+	+	+	+	+	+		+	+	+	+	+	+	+	+	+
Female	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
African-American	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Asian							-	-	-	-	-	-	-	-	-	-	-	-
Hispanic				-		-			-	-	-	-	-	-	-	-		
Native	-												-	-	-	-		-
Race unknown							-		-	-	-	-		-	+			
MD resident	+	-					-	-	-	-	-	-	+	+	+			
Likelihood ratio statistic	889.1	833.7	788.9	1359.5	1381.5	1796.5	7186.7	7643.3	7474.6	8090.8	8322.5	4576.6				853.6	683.8	592.1
SEE													0.55	0.54	0.52			
Adjusted R-square													0.23	0.24	0.24			
N	13115	13406	13466	13115	13406	13115	13115	13406	13466	13115	13406	13115	13116	13405	13465	13118	13406	13466

Note: + indicates positive coefficient at p<.10, - indicates negative coefficient at p<.10. Academic dismissal has been reversed to make variable signs consistent with the other dependent variables.

Table 7. Performance Measures for Returning Native and Transfer Students, 1995-1998

Retention

		Status and credit variables only			All variables		
Time period	Cohort	Natives	Transfers	Difference	Natives	Transfers	Difference
After 1 year	Fall 1995	90.8	82.5	**8.3**	89.5	87.7	**1.8**
	Fall 1996	91.1	82.1	**9.0**	89.5	87.1	**2.4**
	Fall 1997	90.1	82.9	**7.2**	89.3	88.8	**0.5**
After 2 years	Fall 1995	88.2	77.9	**10.3**	85.9	84.1	**1.8**
	Fall 1996	87.9	77.1	**10.8**	86.0	84.4	**1.6**
After 3 years	Fall 1995	86.3	76.4	**9.9**	83.9	84.2	**-0.3**
Average difference				**9.2**			**1.3**

Graduation

		Status and credit variables only			All variables		
Time period	Cohort	Natives	Transfers	Difference	Natives	Transfers	Difference
After 1 year	Fall 1995	12.2	7.6	**4.6**	8.4	5.4	**3.0**
	Fall 1996	11.4	7.2	**4.2**	8.1	5.6	**2.5**
	Fall 1997	11.7	7.4	**4.3**	7.7	6.0	**1.7**
After 2 years	Fall 1995	52.2	40.8	**11.4**	46.2	42.8	**3.4**
	Fall 1996	52.2	40.9	**11.3**	46.7	43.8	**2.9**
After 3 years	Fall 1995	76.4	65.5	**10.9**	73.0	73.4	**-0.4**
Average difference				**7.8**			**2.2**

Cumulative GPA

		Status and credit variables only			All variables		
Time period	Cohort	Natives	Transfers	Difference	Natives	Transfers	Difference
End of semester	Fall 1995	2.82	2.59	**0.23**	2.76	2.67	**0.09**
	Fall 1996	2.84	2.61	**0.23**	2.79	2.69	**0.10**
	Fall 1997	2.88	2.67	**0.21**	2.80	2.76	**0.04**
Average difference				**0.22**			**0.08**

Academic Dismissals

		Status and credit variables only			All variables		
Time period	Cohort	Natives	Transfers	Difference	Natives	Transfers	Difference
End of semester	Fall 1995	3.0	10.5	**-7.5**	3.4	7.3	**-3.9**
	Fall 1996	2.2	9.4	**-7.2**	2.1	6.0	**-3.9**
	Fall 1997	2.2	7.4	**-5.2**	2.2	4.2	**-2.0**
Average difference				**-6.6**			**-3.3**

Some of the performance differences are likely attributable to different admission standards for the two groups. The admissions standards for natives have increased markedly over the past several years, but a similar emphasis has not been placed on transfer admissions. As stated in the introduction, many transfers were rejected for admission as native applicants, and a larger proportion of native students were in the top 10% of their high school class, suggesting that transfer admissions standards are more lax than native student standards.

Conclusion

The data presented in this report support the belief that transfers students as a whole perform worse than natives students on four academic outcomes: one-year retention, one-year graduation, cumulative grade point average and academic dismissals. Less certain is the magnitude of the difference. By focusing on returning students rather than new students, the various integration difficulties that new transfers and new natives face can be ignored. Controlling for credits earned puts transfers and natives on an equal footing, which is essential given the large numbers of credits that transfers bring with them. Even with these factors taken into account, many differences between transfer and natives remain. Depending on whether or not these differences are taken into account, transfers:

- Are retained at rates 1 to 9 percentage points lower than natives.
- Graduate at rates 2 to 8 percentage points lower than natives.
- Earn grade point averages 1/10 to 2/10 of a grade point lower.
- Are academically dismissed at rates 3 to 6 percentage points higher.

The reduction in performance differences between transfer and natives after taking into account housing status and financial aid lends support to the idea that reduced access to these resources is partly responsible for poor transfer performance. Yet even after taking into account housing status, financial aid, major college and demographic differences between the two groups, transfers still perform worse. The inescapable conclusion is that these students are either not academically prepared or not as motivated to finish their degree as the average native student. This conclusion, although perhaps unwelcome, is unsurprising. Over the past several years the university has vastly increased its efforts to recruit native students with top academic credentials. A similar effort has not occurred for transfers.

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